

ABSTRACT

ADVANCED SWITCHING MECHANISM FOR PROVIDING HIGH-SPEED COMMUNICATIONS WITH HIGH QUALITY OF SERVICE

The method described here provides for high-speed, Quality of Service (QoS) driven, and secure transport of voice, video and data packets for facilitating the convergence of multiple networking facilities into one. The method also allows for incorporating robust management features, including localized failure recovery and congestion avoidance, for locally and remotely managing various nodes such as routers, switches, portable devices and other appurtenances including computers and communication links. The method provides for switching of data packets that comprise Internet Protocol (IP), Transmission Control Protocol (TCP), User Datagram Protocol (UDP), Internet Control Message Protocol (ICMP), and other packets, and includes signaling packet configurations. The method allows for replacing one or more bits in the IP header address fields and replacing them with or adding to them unique virtual connection or virtual circuit (VC) identifiers for node-to-node, that is device-to-device, connectivity as well as for representing values or parameters for packet type, QoS, security, network management and node/link resources. Identifiers for the above parameters are developed and saved at each node as a switching table. The values representing the identifiers from a switching table are used to assign virtual connections as well as control the flows of packets. The applicable flow control processes are activated depending on the corresponding parameter in the packet. The values are also used for allocating processing and memory resources at any given node for prioritizing, controlling and redirecting the flow of packets through the node or when initiated at the node.